



May 18, 1988

Mr. Chris Alston
R.M. Wester and Associates
215 Indacom Drive
St. Peters, MO 63376

Dear Mr. Alton:

Enclosed are the radiological results for the samples from the MCA Site. All results are in units of picoCuries per gram (pCi/g) on a dry weight basis for soils, and picoCuries per Liter (pCi/L) for the water and sludge samples. Values for percent moisture are also enclosed.

We routinely perform isotopic analyses for radionuclides in the Uranium and Thorium series by chemical separation and either alpha spectrometry or gas proportional counting. Time permitting, that is the method of choice. Due to your requirement for a quick turn-around, we used the alternate methodology of gamma spectrometry for these samples. As we discussed, this method measures the photon emission of the progeny of the nuclides of interest and assumes an equilibrium condition, an assumption which is not always appropriate.

We normally take more time to dry, grind and homogenize soil samples than we were able to with these samples. This type of preparation adds uncertainty due to an inexact duplication of the condition for which a counting geometry has been established.

I urge you to consider having these analyses confirmed using the radiochemical methods mentioned above. If you have any further questions please contact me directly.

Sincerely,

Patrick T. Kelly
Program Manager
Radiological Programs

enclosures

30285384



Superfund

We have no information as to data quality from this lab. Do they participate in "EPA QA program"?
 EMSL, Las Vegas: -

RADIOLOGICAL RESULTS FOR SLUDGE SAMPLE
 All values are pico Curies per Liter (pCi/L)

EPA Cross Check
 Program

metaTRACE#/RMW ID

Ra-226

Th-232

AA12493/MCA02050688

120 +/- 40

180 +/- 40

~ 180 pCi/l

This sample was analyzed using an intrinsic germanium photon detection system. No other photon emitting radionuclides were detected except K-40 and Ra-228 which are not quantified for this report. The correction and calibration factors used were those for a water sample, although it contained an undetermined amount of solid matter. It would be more accurate to analyze this sample by separating the liquid and solid phases, and analyze each separately.

from below,
 Ra-228 is
 important.

This is
 absolutely
 correct.

We are concerned about solid phase, for disposal.
 Liquids are not allowed in Ra disposal sites.
 Only one sample? Where collected? Is it representative?

RADIOLOGICAL RESULTS FOR WATER SAMPLE #MCA 01908SW

Radium 226

30 +/- 10 picoCuries per gram

Radium 228

61 +/- 18 picoCuries per gram

Uranium 238

< 165 picoCuries per gram

Thorium 232

75 +/- 20 picoCuries per gram

liter? Yes
 This mistake
 brings lab qualifica-
 tion into question.

This sample was counted for ~1000 minutes using an intrinsic germanium photon detection system. These data should be considered preliminary results.

Only one sample? Where collected? How collected and preserved? Was sample filtered to remove sediment? No. These results could easily represent a small amount of sediment in the sample.

PRELIMINARY DATA

Not Filtered

RADIOLOGICAL RESULTS FOR SOIL SAMPLES
All Values are picoCuries per gram (pCi/g)

metaTRACE #/RMW ID	Ra-226	Th-232	U-238
AA12478/MCA005-01B	1.0 +/- 0.1	1.1 +/- 0.2	<3.4
AA12479/MCA006-02A	0.7 +/- 0.1	0.8 +/- 0.1	<3.9
AA12480/MCA007-02B	0.7 +/- 0.1	0.7 +/- 0.1	<4.1
AA12481/MCA004-01A	1.2 +/- 0.2	1.3 +/- 0.2	<2.8
AA12482/MCA008-03A	1.0 +/- 0.1	1.3 +/- 0.2	<4.3
AA12483/MCA009-03B	1.0 +/- 0.1	1.2 +/- 0.2	<4.5
AA12484/MCA010-04A	1.0 +/- 0.1	0.8 +/- 0.1	<4.3
AA12485/MCA011-04B	1.1 +/- 0.2	0.9 +/- 0.1	<4.2
AA12486/MCA012-05A	1.0 +/- 0.1	1.1 +/- 0.2	<1.0
AA12487/MCA013-05B	0.9 +/- 0.1	1.2 +/- 0.2	<5.0
AA12488/MCA014-06A	1.1 +/- 0.2	1.1 +/- 0.2	<3.2
AA12489/MCA015-06B	0.9 +/- 0.1	1.1 +/- 0.2	*
AA12490/MCA016-06C	0.8 +/- 0.1	0.9 +/- 0.2	<6.3
AA12491/MCA017-07A	1.1 +/- 0.2	1.1 +/- 0.2	<3.3
AA12492/MCA018-07B	1.3 +/- 0.2	1.6 +/- 0.2	<1.4
AA12489/MCA015-06B*	U-238 results are 1.5 +/- 0.2 pCi/g		
AA12486/MCA012-05A	Th-230 results are <11 pCi/g		
AA12492/MCA018-07B	Th-230 results are <14 pCi/g		

Note that these concentrations are greater than that detected in the "sludge" and "water" samples.

All samples were air dried until dry to the discretion of the good radiochemistry analyst. The samples were then packed into procedures cans and counted using an intrinsic germanium photon detection system until enough information was available to quantify the 351.8 KeV peak for Ra-226.

What about Ra-228

Samples should have been baked to dryness.

Where were these samples collected? Do they represent the site and background?

5/16/88

Verbal

15 SOIL SAMPLES - WESTER - MetaTrace, Inc:

Telecom from Alston says highest
level is 1.5 picocuries/gm.

Represents typical background.

MIDCOAST

5/17/88

Levels Detected:

- ① Ra 226 120 pico C/L
② Th 232 180 pico C/L

In "sludge". Question those results?

- per Wester and Associates on 5/10/88 (Ties)
— Verbal - Chris Alston

Conversion &

① Ra 226 120 pico/L = pico/gm →

No!
 $\frac{120 \text{ pCi}}{\text{L}} \times \frac{10^{-3} \text{ l}}{\text{gm}} \times \frac{120 \text{ pico}/\text{l}}{(\text{assume density}=1)} \times \left(\frac{3.78 \text{ k}}{1 \text{ Gd}} \right) \left(\frac{1 \text{ Gd}}{8.33 \text{ lbs}} \right) \left(\frac{1 \text{ lb}}{454 \text{ gm}} \right)$
 $= 0.120 \text{ pCi/gm.}$ = 0.1199 pico curies/gram, Someone is confused here.

DOT "Radioactive material" = specified under
49 CFR 173.403(y)

= specific activity $> 0.002 \text{ picuries/gm ac}$
2000 picocuries/gm

② Th 232 180 pico C/L

$180 \text{ picoC/l} \times \left(\frac{3.78 \text{ k}}{1 \text{ Gd}} \right) \left(\frac{1 \text{ Gd}}{8.33 \text{ lbs}} \right) \left(\frac{1 \text{ lb}}{454 \text{ gm}} \right) = [0.1799 \text{ pico}$

→ 0.180 pCi/gm.

What's this convoluted logic all about?

raddata

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St. Louis Airport Drum Site
Radiological Data

Sample No.	Sample Type	Radium 226	Thorium 232	Uranium 238
AA12493/MC Pit sludge		120 +/- 40	180 +/- 40	
A02050688		pCi/l	pCi/l	
mca01908sw	Pit water	30 +/- 10	75 +/- 20	< 165 pCi/l
		pCi/l	pCi/l	
AA12478/MC SOIL		1.0 +/- 0.1	1.1 +/- 0.2	<3.4 pCi/g
A005-01B		pCi/g	pCi/g	
AA12479/MC Soil ?		0.7 +/- 0.1	0.8 +/- 0.1	<3.9 pCi/ α
A006-02A		pCi/l	pCi/ α	
AA12480/MC Soil		0.7 +/- 0.1	0.7 +/- 0.1	<4.1 pCi/l
A007-02B		pCi/l	pCi/l	
AA12481/MC Soil		1.2 +/- 0.2	1.3 +/- 0.2	<2.8 pCi/l
A004-01A		pCi/l	pCi/l	
AA12482/MC Soil		1.0 +/- 0.1	1.3 +/- 0.2	<4.3 pCi/l
A008-03A		pCi/l	pCi/l	
AA12483/MC soil		1.0 +/- 0.1	1.2 +/- 0.2	< 4.5
A009-03B				
AA12484/MC soil		1.0 +/- 0.1	0.8 +/- 0.1	< 4.3
A010-04A				
AA12485/MC soil		1.1 +/- 0.2	0.9 +/- 0.1	< 4.2
A011-04B				
AA12486/MC soil		1.0 +/- 0.1	1.1 +/- 0.2	<1.0
A012-05A				
AA12487/MC soil		0.9 +/- 0.1	1.2 +/- 0.2	<5.0
A013-05B				
AA12488/MC soil		1.1 +/- 0.2	1.1 +/- 0.2	<3.2
A014-06A				
AA12489/MC Soil		0.9 +/- 0.1	1.1 +/- 0.2	none
A015-06B				
AA12490/MC Soil		0.8 +/- 0.1	0.9 +/- 0.2	< 6.3
A016-06C				
AA12491/MC Soil		1.1 +/- 0.2	1.1 +/- 0.2	< 3.3
A017-07A				
AA12492/MC soil		1.3 +/- 0.2	1.6 +/- 0.2	< 1.4
A018-07B				

Structure for database: A:drumsite.dbf

Number of data records: 18

Date of last update : 06/07/88

Field	Field Name	Type	Width	Dec
1	SAMPLEDESC	Character	75	
2	SAMPLE_NO	Character	30	
3	DATE_COLCT	Date	8	
4	COLTD_BY	Character	15	
5	SAMPLE_TYP	Character	15	
6	ANALYST	Character	15	
7	RA226	Character	25	
8	TH232	Character	25	
9	RA228	Character	25	
10	UR238	Character	25	
11	TH230	Character	25	
12	UR235	Character	25	
13	UR234	Character	25	
** Total **			334	